

Date: Tue, 5 Apr 94 04:30:23 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #87
To: Ham-Homebrew

Ham-Homebrew Digest Tue, 5 Apr 94 Volume 94 : Issue 87

Today's Topics:

 advice fm
 G QRP CLUB AT DAYTON
 Power meter
 RADIOKIT

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Mon, 04 Apr 1994 18:31
From: ihnp4.ucsd.edu!swrinde!gatech!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!
unixg.ubc.ca!news.mic.ucla.edu!MVS.OAC.UCLA.EDU!OSYSMAS@network.ucsd.edu
Subject: advice fm
To: ham-homebrew@ucsd.edu

>That's not the problem. You can easily shift the tuning to cover the
>required range, but broadcast FM is 75 kHz deviation FM while aircraft
>transmissions are AM. So you have to build a different detector, and
>get rid of the limiter in the FM receiver to demodulate AM properly.
>It'll still be noisy because the IF bandwidth is way too wide, 200 kHz
>instead of 12 kHz, but it will sort of work after you redesign about
>half the radio. On the other hand, a purpose built aircraft band AM
>receiver isn't expensive.

I've retuned a cheap AM-FM portable to the aircraft band. It
sortof works, the sounds is low but audible, the wide bandwidth
brings in lots of noise and the tuning is picky (but the wide
bandwidth helps with the tuning).

Apparently the cheap FM detector does respond to AM.

I retuned the front end -- mainly changed the RF OSC coil to have fewer turns. I think it tunes from the high end of the FM broadcast band to somewhere slightly above the 2 meter band. I also twisted the adjustments in the IF cans for peak output. Probably narrowed the IF a bit (but not anywhere near enough).

PS: Very few 2 meter stations are actually audible.

Date: Mon, 4 Apr 1994 22:17:06 +0000
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!pipex!uknet!demon!
gqrp.demon.co.uk!g3rjv@network.ucsd.edu
Subject: G QRP CLUB AT DAYTON
To: ham-homebrew@ucsd.edu

Attention Homebrewers Going to Dayton >>>>
You are invited to attend the Forum:

Building Your Own Equipment : George Dobbs G3RJV & Rob Mannion G3XFD
Friday April 29 - 1515 to 1645 - Room 2

and to join us at the G QRP Club Booth with its selection of Kits,
Publications and QRP related items
Much of it designed for the homebrewer
..... and a few English voices

--
George Dobbs G3RJV
G-QRP Club

Date: 4 Apr 1994 14:55:55 -0500
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!vixen.cso.uiuc.edu!
moe.ksu.ksu.edu!matt.ksu.ksu.edu!not-for-mail@network.ucsd.edu
Subject: Power meter
To: ham-homebrew@ucsd.edu

Hi:

I want to make a power meter to measure signals in the -30 to +30 dBm range. I would like the measurements to be fairly accurate. I'm thinking about using a diode detector. Does anyone have any suggestions for doing this. Any comments or references would be welcome.

thanks,
nam

mortense@matt.ksu.ksu.edu

```
          ()      When all you have is a hammer ...  
#####=====||  
          ###      ... everything looks like a nail!
```

Date: 4 Apr 1994 20:41:29 GMT
From: ihnp4.ucsd.edu!swrinde!elroy.jpl.nasa.gov!ncar!stout.atd.ucar.edu!
owens@network.ucsd.edu
Subject: RADIOKIT
To: ham-homebrew@ucsd.edu

Has anyone done business with a company called RADIOKIT
recently?

I have not seen any advertising from them in the last few
years.....They used to carry some useful parts for homebrew
projects as well as a line of kits.

Any info on current phone number for them and/or your
experience with them would be appreciated.

Thanks!

Chip Owens, NW00
Boulder, CO

--
Chip Owens (owens@stout.atd.ucar.edu)
NW00 (boatanchors forever!)

Date: 4 Apr 1994 16:49:25 GMT
From: elroy.jpl.nasa.gov!sdd.hp.com!hpscit.sc.hp.com!rkarlqu@ames.arpa
To: ham-homebrew@ucsd.edu

References <2ng30c\$g7r@crl2.crl.com>, <2nlebi\$j53@hpscit.sc.hp.com>,
<2nmnbq\$iel@crl.crl.com>i
Subject : Re: How to do PSK demodulation?

In article <2nmnbq\$iel@crl.crl.com>, Donald J. Miller <dmiller@crl.com> wrote:
>

>Once again: it is NOT necessary for PSK to have a constant envelope.
>If you disagree with this, go talk to one of your HP friends that are
>working on the test equipment for North American digital cellular.
>NADC is $\text{Pi}/4$ DQPSK and it does NOT have a constant envelope. Folks

As I said, this is a semantic discussion. I don't agree with their terminology, that's all.

>have, and continue to ship what they call BPSK systems that fall
>under your definition of ASK. To be consistant with your stand that
>ONLY the phase changes in PSK, one would conclude that only the
>amplitude changes in ASK, right? A phase change at the zero crossings
>would not be allowed. It has always been my impression that ASK

I am allowing "negative" amplitudes, so 180 degree phase shifts
(and only 180 degree phase shifts) are allowed in my definition of
ASK. Again, my definition.

>was like sending data into an AM modulator -- complete with the
>offset so that over 100% modulation was avoided. It should be
>possible to get NRZ data directly from an envelope detector without
>playing transition games.

The envelope detector cannot distinguish negative from positive polarity so it doesn't work here.

>Vendors such as Alpha Industries produce "Bi-Phase modulators" as
>standard products for implementation in BPSK modulators. These products
>have NO Q CHANNEL INPUT, so it would be impossible to generate a
>constant envelope signal with them.

A true phase modulator should have only one input, "phase".
What I don't know about that specific one is if the phase port is
linear or digital. Modulators with I and Q inputs are for QAM.

To produce true BPSK, as I define it, take your NRZ data, run it
through a finite bandwidth pulse shaping filter, and then run it
into a linear, *analog* phase modulator (with no ideal switches).

To produce true ASK, as I define it, take your NRZ data, run it
through a finite bandwidth pulse shaping filter, and then run it

into a linear, *analog* bipolar amplitude modulator (a double balanced mixer for example). If you don't like the bipolar aspect, bias the data so it is unipolar.

As the bandwidth goes to infinity, the systems become more and more alike.

If you don't watch what you're doing, you can easily get a combination of the two with neither constant envelope nor constant (absolute value of) phase. For example, following a BPSK modulator with a bandpass filter produces AM via PM/AM conversion. Moral, do all filtering at baseband. (That comment ought to produce so controversy!).

>This "symantic nit" has turned into a rather lively discussion, it
>would appear. I have checked the books at my disposal and can't
>really find any that have drawn the lines between modulation formats
>in the manner you describe. What sources have led you to these
>conclusions? I would like to check into them.

Essentially, these are my own ideas; you won't find any real discussion of this in books, as far as I know. You'll just have to keep reading Usenet to keep up :-). I have read every book I could get my hands on about this subject, and they all gloss over the details of implementation. As I said in another posting, try Feher's books and John Bingham's book on modem design for starters. (Ever notice how you never see a *schematic* in those communications theory books, only block diagrams.)

>~ dmiller@crl.com ~~~~~

Rick Karlquist N6RK
rkarlqu@scd.hp.com

Date: Mon, 4 Apr 1994 14:24:34 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!emory!wa4mei!ke4zv!gary@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <2mriqq\$a0l@cs.uct.ac.za>, <2nn1ge\$kn7@hp-col.col.hp.com>,
<1994Apr3.222425.14611@cs.yale.edu>ry
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: advice fm

In article <1994Apr3.222425.14611@cs.yale.edu> tstrohma@theodolite.ae.calpoly.edu (Trevor Strohman) writes:

>In article <2nn1ge\$kn7@hp-col.col.hp.com>, Bob Witte <bobw@col.hp.com> wrote:
>>
>> I think other posters have pointed out that this will NOT be a simple mod.
>> There are many cost-effective solutions to listening to the aircraft band
>> if that is the goal here. Check your local Radio Shack catalog.
>>
>
>Why? If it's an analog FM radio, couldn't you put an inductor or
>capacitor in series with the tuning system to change the frequency, or
>am I way off?

That's not the problem. You can easily shift the tuning to cover the required range, but broadcast FM is 75 kHz deviation FM while aircraft transmissions are AM. So you have to build a different detector, and get rid of the limiter in the FM receiver to demodulate AM properly. It'll still be noisy because the IF bandwidth is way too wide, 200 kHz instead of 12 kHz, but it will sort of work after you redesign about half the radio. On the other hand, a purpose built aircraft band AM receiver isn't expensive.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Mon, 4 Apr 1994 14:16:17 GMT
From: ihnp4.ucsd.edu!swrinde!emory!wa4mei!ke4zv!gary@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <2n6vv4\$p5n@usenet.INS.CWRU.Edu>,
<1994Mar29.195903.22680@ke4zv.atl.ga.us>, <2nd871\$7nl@crl2.crl.com>
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: How to do PSK demodulation?

In article <2nd871\$7nl@crl2.crl.com> dmiller@crl.com (Donald J. Miller) writes:
>Gary Coffman (gary@ke4zv.atl.ga.us) wrote:

>
>: You can use a simple discriminator detector, run it's output through
>: a slicer that switches at zero crossing, use a Costas loop or squaring
>: loop to recover clock, and sample the slicer waveform at bit centers to
>: data detect.

>
>Wrong.
>

>Costas and squaring loops are used for CARRIER recovery, not clock
>recovery. Discriminators have been used to recover PSK where optimum
>performance is not required, but synchronus detection is far better.

Wrong. :-)

Costas loops, or somewhat simpler variants, can be used for clock recovery, the WA4DSY modem does for example. And discriminator detectors are superior to synchronous detectors when lock up speed is critical, as it is in fast packet modems. There is a 6 db S/N penalty, but that's usually acceptable. The trick is to use a tracking data detector after the discriminator so that frequency errors up to +/- 5 kHz are compensated.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
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Lawrenceville, GA 30244				

End of Ham-Homebrew Digest V94 #87
